



Risk Excellence Notes

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- ♦ **SCIENCE NEWS**
- ♦ **MORE INFORMATION ON UPCOMING EVENTS**
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LOS ALAMOS FIRES



In mid-May, fire swept through Los Alamos, New Mexico, and destroyed over 260 homes, left hundreds of families homeless, torched more than 47,000 acres and has reportedly caused an estimated \$1 billion in damage.

**Donations for our colleagues can be sent to:
Department of Energy
Attn: Northern New Mexico Fire Recovery Fund
Office of Chief Financial Officer, CR-52
P.O. Box 500
Germantown, MD 20874-0500**

Checks should be made payable to the Department of Energy and indicate they are for the Fire Recovery Fund. Donations are tax deductible.

A VISION FOR CLEANUP

*By James Fiore, Deputy Assistant Secretary – Office of Site Closure,
U.S. Department of Energy*

Late last year the Office of Site Closure of the U.S. Department of Energy's Office of Environmental Management (EM) redirected its program to have the sole focus of achieving cleanup and closing sites. To meet this challenge, the Office of Site Closure developed a five-point vision and articulated the necessary keys to achieve the vision.

The Site Closure Program will:

- Set the standard for safe, cost-effective closure of nuclear facilities;
- Be the model for transitioning Government activities from operations to closure;
- Achieve end-states that are safe now and enable protective, effective stewardship for the future;
- Deploy new technologies to help the drive toward closure; and
- Focus on closing sites under its responsibility by 2006.

EM is responsible for the management of sites and facilities contaminated during, and wastes generated as a result of, the Cold War. Past operations resulted in radioactive, hazardous, and mixed wastes and contamination at these sites. EM's mission is to treat and dispose of these wastes, and eliminate, or reduce to safe, prescribed levels, any risks to human health and safety or the environment that may be posed by these contaminants.

Since EM was established in 1989, it used a program office structure to address its specific activities: waste management, environmental restoration, technology development, and nuclear materials stabilization. In late 1999, EM reorganized to better focus on the completion of its mission on a site level (i.e., waste management and site cleanup), and to enable closer coordination between Headquarters and the field activities.

Under the new EM organization, the Office of Site Closure is responsible for the entire missions of waste management, environmental restoration, and nuclear materials stabilization at seven of EM's twelve operations offices (Albuquerque, Chicago, Nevada, Oak Ridge, Oakland, Ohio, and Rocky Flats). These responsibilities encompass work at 109 of EM's 113 sites; including storage, treatment, and disposal of legacy waste; management of nuclear materials processing and production facilities; remediation of large tracts of land with soil and/or groundwater contamination; and decontamination and decommissioning of numerous surplus facilities. In some instances, remediated surplus facilities will be transferred to the local community for economic development.

(Continued on Page 7)

LETTER FROM THE EDITORS

All waste cleanup projects require vision, cooperation, understanding, technical knowledge, and innovation. Much of cleanup is about establishing boundaries and then working to achieve those limits. Risk aspects of these subjects, as they relate to cleanup goals, are covered in this issue of Risk Excellence Notes. In this issue, we have focused on the U.S. Department of Energy's (DOE) program. We are very pleased to present articles from DOE and the U.S. Environmental Protection Agency Headquarters that extend their vision. Equally exciting is the advent of an International Risk Network – one that brings together people who are handling legacies from the Cold War. As a part of this exchange and in the spirit of openness, we offer to the Russian speaking members the opportunity to read about the Network in their vernacular. This is followed by a group of articles that touch upon specific risk-related activities within the DOE program. Last are some of the thoughts, opinions, and frustrations held by some of our readers. All-in-all, we are very pleased and hope that you will be too!

Nancy Lane
Lane Environmental, Inc.

Mary Jo Acke Ramicone
U.S. Department of Energy
Center for Risk Excellence

EDITORS' NOTE: With the reorganization of the U.S. Department of Energy's (DOE) Office of Environmental Management (see Risk Excellence Notes —January 2000), the Center for Risk Excellence reports programmatically to the DOE Office of Safety, Health and Security Director — Randal Scott. This relationship is captured in the new multi-year program plan Fiscal Years 2001-2005, NATIONAL HEALTH AND SAFETY RISK PROGRAM. The plan will soon be available from the Center for Risk Excellence (call 888/DOE-RISK, or visit the web site <http://riskcenter.doe.gov>). We are pleased to have the following article from Mr. Scott, a recent recipient of a Presidential Rank Award.

**A Word from the Director of the U.S. Department of Energy's
Office of Safety, Health and Security —**

TO BE A LEADER IN SAFETY

As cleanup at the U.S. Department of Energy (DOE) sites accelerates, we must ensure that we have the systems, procedures, technological tools and behavioral attitudes in place to improve our safety performance. One of the principle goals of the Office of Safety, Health and Security (EM-5) is to upgrade Environmental Management's (EM) safety record and institutionalize safety awareness throughout EM Headquarters and our field offices, contractors and programs. Our intent is to be a leader in safety, with a record that meets or exceeds that of the best private firms. To accomplish this aim, we must look for ways to enhance the current DOE safety paradigm. We need to increase knowledge and awareness of the importance of safety at all levels, motivate workers while engaging their active participation, galvanize the EM leadership to fully address safety issues, and inculcate the inherent understanding that safety is everyone's responsibility.

Safely accomplishing the DOE cleanup safely requires the full use of a variety of tools, including risk analysis, risk management, and risk communication. In order to protect workers and the public during cleanup operations, we must fully utilize what we already know about the likelihood and consequences of accidents and exposures. The Center for Risk Excellence can help us do this, and that is one reason why I am pleased to be its new Headquarters sponsor. I believe that our relationship can create a synergy, which will truly benefit the Department, its workers, and the residents of communities near our sites.

In addition to supporting the Center's work with DOE Operations Offices in solving specific issues, I welcome the Center's active participation in forging a new safety culture, and in ensuring that workers and the public fully participate in decisions affecting their safety and health. Toward that end, I have been working to focus the Center's activities around three central themes: the role of risk in safety and health, balancing worker risk with cleanup risk in environmental decision-making, and safety and health risk considerations in technology development and use.

EM-5 will be successful when everyone, from the individual worker doing the cleanup to the top officers of DOE and its contractors, considers the safety impact of everything they do. I believe that the Office of Safety, Health and Security, with the help of the Center for Risk Excellence and others, can be instrumental in achieving the objective of a truly safe cleanup.

Randal S. Scott, Director
U.S. Department of Energy's Office of Safety, Health and Security

WHAT'S HAPPENING AT THE



**A Word from the Director of the U.S. Department of Energy's
Center for Risk Excellence —**

INTERNATIONAL OPPORTUNITY

Former enemies in the Cold War are now working together to address hazards to communities and ecosystems from the chemical and radiological wastes resulting from that war. In 1995, the U.S. Department of Energy's (DOE) Office of Environmental Management (EM) published *Closing the Circle on the Splitting of the Atom*. This document elaborated on the environmental legacy of nuclear weapons production in the U.S. and what actions the DOE was taking to address these wastes. With more than a billion curies in more than 36 million cubic meters of radioactive wastes, the only "good news" was, that for the most part, the wastes are "contained." Of the total waste volume, about one-percent is highly radioactive, but this one-percent contains 95 percent of the total curies to be managed. These wastes are in tanks at Savannah River, Hanford, and Idaho. Because of containment, the pathways to potential receptors are extremely limited, and thus the risks are low. Ironically, the Russian weapons complex now has less waste in storage, because large quantities of its high-level wastes (estimated at 1.7 billion curies) were poured directly into rivers or injected deep underground. Widespread waste discharges have left Russia and surrounding countries with large areas of contamination. Because these wastes are not contained, there are many potential pathways of exposure and the risks to the public and ecosystems are evident. In many of the countries of the former Soviet Union people are ill from radiation exposure.

In early May, I attended a North Atlantic Treaty Organization Conference on Risk Assessment Activities for the Cold War Facilities and Environmental Legacies. I had the privilege of "rubbing elbows" with risk experts from twelve Eastern European Nations, many of which were part of the former Soviet Union. All of these nations are faced with the environmental legacies of the Cold War directly, or because wastes have moved through water or soil across their boundaries. These experts requested we share information on risk assessments, risk management, and risk communication. In response to their requests, I proposed that we establish a Risk Assessment Network. On pages 4 and 5, this agreement is published in Russian and English in its entirety, offering an exchange of information, science, training, and students. *Risk Excellence Notes* will be one vehicle for initiating and maintaining this Network. We have a wonderful opportunity to learn from these international experts and to share our knowledge and experiences to help them and ourselves. Today, more than ever before we are one global community, and the opportunity to ensure the future of that global community is now!

Alvin L. Young, Director
U.S. Department of Energy's Center for Risk Excellence

IN OTHER NEWS FROM THE CENTER . . .



Eco-Informa 2001 is a unique environmental conference focusing on global risk challenges of the 21st century. The aim of this sixth international meeting is to share risk analysis information among professionals and the public and define roadmaps for integrated solutions in the new millennium. *Eco-Informa* is designed to bridge the gap between evolving scientific knowledge and innovative applications that can successfully address emerging environmental issues. This conference, scheduled for May 15-18, 2001 at Argonne National Laboratory, provides a platform for communicating new information about science, technology, and integrated strategies for solving critical problems. The goal is to identify interdisciplinary approaches that will lead to sustainable decisions for the global community.

Presentations on the four session themes listed below are elicited.

1. Water: land use, rights, distribution, purification, quality criteria, alternative uses.
2. Food: resource use, supply, irradiation, packaging, distribution, genetically modified organisms, and other bioproducts.
3. Energy & Transportation: energy generation, conservation, natural and renewable resources, distribution, infrastructure, global mobility, and alternative modes.
4. Environmental Pollution: industrialization, urbanization, biodiversity, climate change, persistent atmospheric pollutants, and waste site remediation.

Several short courses will be offered in conjunction with *Eco-Informa 2001* on topics such as web-based communication and outreach programs, use of Geographic Information Systems, cumulative risk assessment, enhanced natural resource management systems, and risk-based evaluation of new technologies.

For more information on *Eco-Informa* visit our web site <http://riskcenter.doe.gov>. To register contact Joan Brunsvold, Argonne National Laboratory (630/252-5585; email jbrunsvold@anl.gov).

WHAT IS THE CENTER FOR RISK EXCELLENCE?

The Center for Risk Excellence was established in 1997 to help the U.S. Department of Energy (DOE) address risk issues associated with its environmental management activities. Located at the Chicago Operations Office, the Center provides field-based risk expertise and resource coordination to those in Headquarters, the Field/Operations Offices, and outside the agency. With a federal staff of seven, the Center has created an extended organization combining DOE staff from each of its field offices (i.e., Board of Directors), DOE laboratories (i.e., Support Team), Cooperative Agreement Institutions, contractors, and other organizations. For more information, call 888-DOE-RISK or visit the web site <http://riskcenter.doe.gov>.

WHAT'S HAPPENING AT THE



INTERNATIONAL RISK NETWORK

Risk Assessment Experts from more than 20 countries assembled in Bourgas, Bulgaria, on 2-11 May 2000 to participate in the North Atlantic Treaty Organization (NATO) ADVANCED STUDY INSTITUTE on RISK ASSESSMENT ACTIVITIES for the COLD WAR FACILITIES and ENVIRONMENTAL LEGACIES.

During the Institute meeting, there was a recognized need for the networking of information and expertise to facilitate the use of risk in resolving issues associated with the cleanup of the waste legacies from the past Cold War. Accordingly, the Institute participants from 13 countries proposed that this memorandum be prepared to establish the RISK ASSESSMENT NETWORK for COLD WAR FACILITIES and ENVIRONMENTAL LEGACIES.

The undersigned participants agree to establish this network for at least three major activities. These activities include:

1. The exchange, management and distribution of information on risk assessment, risk management and risk communication supporting health, safety and environmental protection;
2. The facilitation of scientific collaboration to include the determination of common technical/scientific problems, the sharing of appropriate scientific expertise, and the identification of potential sources of funding for this collaboration; and

3. The establishment of a unique program on training and exchanging students from 13 countries in the disciplines critical to the science and application of risk.

Co-coordinators for this activity will be Alvin L. Young, Director of the Environmental Management's Center for Risk Excellence, United States Department of Energy, and Vitaly A. Eremenko, co-director of the 2000 NATO Advanced Study Institute and Head of the Department of the International Chair Network on *Transfer Technologies for Sustainable Development* under the United Nation Education, Science and Culture Organization (UNESCO) and International Center of Education System (ICES). Dr. Eremenko has established effective coordination with those nations in Eastern Europe and former Soviet Union engaged in risk programs supporting Cold War Facilities and Environmental Legacies.

The following individuals from 13 countries have agreed to serve as the focal points for this activity and signify their concurrence to this Memorandum without commitment of funding from their representative countries. They are invited to send to co-coordinators the lists of working groups from their own countries during May-June, 2000.

EDITORS' NOTE: *On the next page is a Russian language translation of the above information. We provide this to those in the former Soviet Union Countries who do not speak or read English so that they can know what is said about their program in a language common to them, and to further the exchange of information.*

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WHAT'S HAPPENING AT THE



МЕМОРАНДУМ О ВЗАИМОПОНИМАНИИ.

Специалисты по анализу риска, более чем из 20 стран, были приглашены в Бургас, Болгария, в период 2 - 11 Мая 2000, для участия в занятиях ИНСТИТУТА ПЕРСПЕКТИВНЫХ ЗНАНИЙ ОТДЕЛА НАУКИ НАТО по теме “МЕТОДОЛОГИЯ АНАЛИЗА РИСКА В РЕШЕНИИ ПРОБЛЕМ НАСЛЕДИЯ ХОЛОДНОЙ ВОЙНЫ, - проблем ВОЕННО-ПРОМЫШЛЕННОГО КОМПЛЕКСА И ОКРУЖАЮЩЕЙ СРЕДЫ”.

В процессе занятий и внеаудиторных встреч была выявлена потребность и целесообразность в организации по тематике Института сети обмена информацией, знаниями и опытом, с помощью которой можно было бы облегчить применение методологии риска к решению проблем ликвидации наследия прошлой холодной войны.

Как следствие, участники Института - специалисты из тринадцати (13) стран, предложили подготовить этот меморандум, определяющий создание ИНФОРМАЦИОННОЙ СЕТИ для ОБМЕНА ДАННЫМИ по АНАЛИЗУ РИСКОВ, имеющих отношение к ПРОБЛЕМАМ НАСЛЕДИЯ ХОЛОДНОЙ ВОЙНЫ, а именно, - СНИЖЕНИЮ РИСКА ОТ ВОЕННО-ПРОМЫШЛЕННЫХ КОМПЛЕКСОВ И ЗАГРЯЗНЕННОЙ ОКРУЖАЮЩЕЙ СРЕДЫ.

Нижеподписавшиеся согласились в том, что создаваемая сеть будет способствовать установлению, по крайней мере, трех главных видов деятельности:

1. Организации обмена и распределения информации о методологии и результатах по анализу риска, а также о достижениях в управлении риском и распространении данных по риску, направленных на поддержание здоровья, безопасности и защиту окружающей среды;
2. Содействия научному сотрудничеству, которое включало бы выявление общих технических / научных проблем, обмен соответствующими специальными научными знаниями, и поиск потенциальных источников для финансирования этого сотрудничества.
3. Формирования единственной в своем роде программы обучения и обмена студентами этих тринадцати стран в остающейся поныне дефицитной области знаний и учебных дисциплин, связанных с наукой и практическим применением методологии анализа риска.

Координаторами этой деятельности будут Алвин Л. Янг, Директор Центра определяющих разработок по риску для управления окружающей средой, Министерства энергетики Соединенных Штатов, и Виталий А. Еременко, со- директор Института перспективных знаний отдела науки НАТО 2000 года, Руководитель Департамента международной кафедры -

сети “Передача технологий для устойчивого развития” - совместного подразделения Организации ООН по образованию, науке и культуре (ЮНЕСКО) и Международного центра обучающих систем (МЦОС).

Профессор, доктор наук В. Еременко установил эффективную координацию с представителями тех стран Восточной Европы и прежнего Советского Союза, которые интересуются или заняты в программах анализа риска, имеющих отношение к решению проблем наследия прошлой холодной войны, - проблем военно-промышленного комплекса и окружающей среды.

Нижеследующие лица от тринадцати стран согласились работать как “focal-points” (национальные координаторы) для осуществления описанной выше деятельности и выражают их согласие с данным Меморандумом, исключая однако обязательства по финансированию работы сети представляемыми ими странами. Подписавшим этот документ предложено в течение мая - июня 2000 информировать координаторов сети о списочном составе рабочих групп от тринадцати стран.

КООРДИНАТОРЫ:

Алвин Л. Янг / Alvin L. Young /

Директор, Центр определяющих разработок по риску для управления окружающей средой, Министерства энергетики Соединенных Штатов,
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(Vitaly Eremenko and Alvin Young shake hands. They were among risk experts from 13 countries that were present for the signing and initiation of the International Risk Network.)

CLEANUP GOALS AND ISSUES

EDITORS' NOTE: *The topic for this newsletter — Cleanup Goals & Issues — comes from a stakeholder's earlier letter to us (Risk Excellence Notes, February/March 2000). In it, he expressed his concern over how cleanup standards are established. An excerpt from the letter follows:*

"...multi-billion dollar environmental cleanup decisions will be based on standards that are applied, and those standards should not be established by casual groups..."

-Marty Bensky, Richland, Washington.

Next is a small selection of the problems faced.

MAKING SAFER, MORE LIVABLE COMMUNITIES

By Timothy Fields, Jr., U.S. Environmental Protection Agency

The Office of Solid Waste and Emergency Response (OSWER) recognizes that innovation is the key to ongoing achievement in managing solid and hazardous wastes, preparing for and preventing chemical and oil spills, and cleaning up contaminated properties. OSWER is a much different place today than it was in the 1980s and early 1990s. We are continuing to simplify many of our regulatory programs, introduce greater flexibility in our requirements, reduce costs, help businesses to better understand and comply with environmental requirements, and improve access to environmental information. Our overall goal remains unchanged—protecting human health and the environment. The risks; however, are now addressed where they occur—at the local level.

An emphasis on "livability" promotes continued investment in already industrialized areas, with two very important outcomes: our inner cities can return to vibrant and safer places to live and work and less sub-

urban farmland and wildlife habitat will be put into industrial uses. OSWER's programs today are leveraging the multiple agendas of economic development, open space protection, and job creation.

The programs and projects highlighted below provide a glimpse of how OSWER programs have found better ways to protect public health and the environment and how we have started on a path to making communities safer and more livable.

LAND DISPOSAL RESTRICTIONS REINVENTION

Under the Resource Conservation and Recovery Act (RCRA), hazardous wastes must meet "land disposal restrictions" (LDR) treatment standards which require that wastes placed in land-based units be treated to levels that will minimize threats to human health and the environment. Beginning in 1993 with the first LDR Roundtable, U.S. Environmental Protection Agency (EPA) waste programs have worked with stakeholders to explore new cost-effective, flexible approaches to streamlining the LDR program. EPA sponsored a second Roundtable in July 1998 to gain new information on improving the LDR program.

A soon-to-be published advanced notice of proposed rulemaking (ANPRM) describes possible improvements to the LDR program. Specifically, the ANPRM is investigating whether EPA can further encourage the use of innovative treatment technologies as well as source reduction and recycling options. The notice will also take a broad look at stabilization to ensure that the variety of reagents being used are protective of human health and the environment.

One outcome of existing LDR reforms was the development of "universal treatment standards" (UTS). Original treatment standards were set for each specific waste stream individually which created difficulties in some situations, such as when different waste streams were combined. The UTS use a consistent set of treatment levels for each constituent re-

gardless of the waste stream it is in. Also, by streamlining paperwork requirements, analyses showed that the burden to the regulated community was reduced by 1.6 million hours per year. Additional streamlining measures are being investigated.

A tailored set of LDR treatment standards for hazardous contaminated soils facilitate the treatment of these wastes with the understanding that the UTS, which primarily address industrial hazardous wastes, are not always appropriate or achievable for hazardous soils. We expect these alternative standards will provide the needed flexibility for expedited treatment of hazardous soils.

SETTING RISK-BASED CLEANUP STANDARDS

Several OSWER offices are tailoring cleanups to the expected future use of the site. This risk-based approach allows less stringent standards for parcels that will be used for industrial purposes as opposed to residential areas. This approach results in speedier cleanups and cost savings at some sites, which allows cleanup dollars to go further and address more areas.

OSWER has helped state agencies that implement the underground storage tank (UST) program to develop risk-based decision-making processes that they can use to take into account the relative risk UST releases may pose to human health and the environment. OSWER has also supported efforts to help states evaluate UST risk-based decision-making corrective action programs. Early evaluations of these efforts indicate that risk based decision making for UST corrective action programs expedites the remediation and closure of leaking UST sites.

Timothy Fields, Jr. is the Assistant Administrator for the U.S. Environmental Protection Agency's OSWER. For more information see Innovations in OSWER at <http://www.epa.gov/swerrims/whatsnew.htm>. This report presents an integrated picture of OSWER's major innovations and describes how its programs have evolved to meet new challenges and also improve existing ways of doing business.

RCRA/Superfund hotline is 800/424-9346, or 703/412-9810 if calling from Washington D.C.

CLEANUP GOALS AND ISSUES

A Vision for Cleanup (Continued from Page 1)

The Office of Site Closure sees the reorganization as an opportunity to refocus on the core mission of achieving site cleanup. To achieve this new vision, the Office of Site Closure has identified several key tools (see Exhibit 1) that will enhance the ability to achieve this vision.

These tools will enhance the decision process at cleanup sites. Ultimately, a variety of factors influence which remedy is selected and the cleanup levels reached at the various DOE sites. The remedy selection process involves extensive interactions with the public, regula-

tory agencies, and other stakeholders. Various criteria are evaluated, including effectiveness of the proposed remedy, its ability to be implemented, and overall cost. The actual cleanup level achieved reflects a balancing of the various factors involved and is a site-specific decision. All decisions are made to ensure that the current and future risk to the environment and the public is acceptable.

For more information about the activities of the Office of Site Closure, contact Marc Jones (301/903-6216; email Marc.Jones@em.doe.gov) or see the Office of Site Closure web site which will be accessible through the EM Home page by Summer 2000.

Exhibit 1: KEY TOOLS TO ACHIEVE THIS VISION

- **INNOVATIVE CONTRACTING APPROACHES.** Performance-based contracting is very important, and new and existing contracts must incorporate incentives that reward contractors that successfully close sites on time and within cost. The primary contracting strategy will be to identify the appropriate incentives for each closure site and to improve confidence in each site's baseline for closure.
- **ENHANCED PROGRAMMATIC INTEGRATION.** The Office of Site Closure will work with the newly created Office of Integration and Disposition to identify ways to optimize closure activities across sites, to sequence events to minimize costs, and to reach agreements necessary to close sites as quickly and safely as possible.
- **ADMINISTRATIVE STREAMLINING.** Non-safety-related policies and procedures that are not relevant to the tasks at hand and offer little value to sites that are going out of business will be reduced. The Office of Site Closure will also streamline requirements associated with disposition, records management, and workforce transition.
- **REGULATORY STREAMLINING.** Working with regulators, the Office of Site Closure will shift the focus from compliance with procedures, rules, and regulations to one of identifying means to solving problems collaboratively with minimal distraction from actual cleanup activities.
- **IMPROVED TECHNOLOGIES.** The Office of Site Closure will work closely with the Office of Science and Technology to apply best science and technology to site closure technical challenges and share results across the DOE complex.
- **NEW FINANCIAL/BUDGET STRATEGIES.** The Office of Site Closure will work with the Office of Management and Budget and Congress to refine and streamline the budget and financial processes to focus more on site closure.

EDITORS' NOTE: *Cleaning up the environment seems to consistently raise several issues that the communities involved will need to resolve. We believe that addressing the following questions is crucial to making progress.*

1. *What should the relationship between cleanup and land-use be?*
2. *To what degree should the U.S. Department of Energy (DOE) or any other responsible party assume institutional control?*
3. *How should one anticipate and model for catastrophic events?*
4. *What are the acceptable assumptions underlying cleanup levels?*
5. *What is the appropriate way to use probabilistic and deterministic risk analyses?*
6. *What are the cost and risk implications in meeting suggested cleanup levels?*

SETTING PLUTONIUM ACTION LEVELS

From the Rocky Flats Radionuclide Soil Oversight Panel

At the U.S. Department of Energy's (DOE) Rocky Flats Site an independent study has proposed a radionuclide soil action level (RSAL) of 35 picocuries/gram for plutonium. The RSAL was developed at a dose limit of 15 millirem and the scenario that people were living on a ranch at the site. This level is considerably less than the allowable amount in the 1996 cleanup agreement between the DOE, the U.S. Environmental Protection Agency (EPA), and the Colorado Department of Public Health and the Environment (CDPHE). The cleanup agreement covers environmental remediation activities since the cessation of nuclear weapons production in 1992.

The independent study was initiated when members of the community became concerned after learning how the Rocky Flats RSALs compared to those elsewhere (Table 1). Mary Harlow, RSAL Oversight Panel (OP) member, stated that the RSAL OP process set a new paradigm for public

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CLEANUP GOALS AND ISSUES

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Table 1: 1996 COMPARISON OF SOIL ACTION LEVELS FOR PLUTONIUM

LOCATION	PLUTONIUM ACTION LEVEL*
Rocky Flats Environmental Technology Site	651
Nevada Test Site	200
Enewetak Atoll South Pacific bomb test site	40
Hanford Nuclear Reservation in Washington state	34
Johnson Atoll	15

* in picocuries per gram of soil

participation. "This was a total community effort. DOE did not interfere with the process." Another RSAL OP member, Hank Stovall, believes the work advanced risk assessment by applying Monte Carlo distributions, and that including a prairie fire scenario was an important addition.

Results from the entire independent assessment which included several project tasks can be found on the web at <http://www.rfcab.org./SALOPreports.html>. Tasks included: research RSALs used at other plutonium-contaminated sites around the world; explore computer models that can be used to determine RSALs; recommend assumptions for the calculations; conduct an independent calculation; and analyze the results from an ongoing project (the Actinide Migrations Studies) to determine whether the findings are applicable.

This recommendation is now under review by the DOE, EPA, and CDPHE. As noted in the independent report, "The approach to cleanup that is ultimately implemented by the DOE at the Rocky Flats will involve many political, social, economic, and moral decisions. It is imperative that all involved in the decision process recognize these factors and the integration of ideas that must go into making a decision of this type." DOE is reviewing the inputs, parameters, and assumptions used in the calculation; evaluating how the RSAL OP recommendations compare

with the regulatory framework under which it must work; developing site specific information on the impact of a prairie fire at Rocky Flats; and initiating an RSAL review in conjunction with the EPA and CDPHE.

For more information contact Mary Harlow (303/430-2400) or Hank Stovall (303/466-5986) co-chairs of the RSAL OP, or Jeremy Karpatkin (303/966-8392) of DOE.



SCIENCE IN SUPPORT OF RADIATION RISK POLICY

By Antone L. Brooks, Washington State University

The Low Dose Radiation Research Program supports research that will help determine health risks from exposures to low levels of radiation (less than 10 rad). This information is critical to our providing adequate and appropriate protection of people, as well as our effectively using our national resources.

There has been extensive research on the health effects of high radiation doses to people. With that data, we set exposure standards to protect both the public and the workforce. Models were used to extrapolate and predict cancer at low radiation doses from the cancers observed following exposure to high doses of radiation. It has not been possible to directly demonstrate cancer induction to support these predictions. Over the next 100 years it is expected that human radiation exposure will be at low doses from medical tests, waste cleanup and environmental isolation of materials associated with nuclear weapons and nuclear power production.

Advances in science and technology have provided new information on the cellular and molecular biology of radiation-induced change as a function of radiation dose. Because we can now study individual cells, we know that when one cell is dosed with radiation other nearby cells will also respond. Cells communicate with one another. This changes how we think about radiation dose and risk and is

generating new theories about cancer. Also, the human genome is sequenced making it possible to evaluate our specific genetic susceptibility.

Communicating this scientific knowledge among scientists, modelers, regulators, and those who wish to make informed decisions, including members of the public, will be key to setting good policy.

For more information, contact David G. Thomassen (301/903-9817) or Antone L. Brooks (509/372-1912) or check their web site at <http://www.lowdose.org/>.

CLEANUP CRITERIA: CAN 'RISK-BASED' CRITERIA TELL THE WHOLE STORY?

By Seth Guikema, Stanford University

Many people believe that cleanup criteria for contaminated sites within the U.S. Department of Energy (DOE) complex are not always set to achieve the greatest possible risk reduction with the available budget. In a paper presented at the Waste Management 2000 conference (Guikema and Bollinger, 2000), Mark Bollinger and I argued that this occurs largely because of the regulatory requirements that govern the DOE cleanup work. We also outlined some broad areas in which work could be done to improve the basis of cleanup criteria from a risk-based perspective — an ongoing DOE Center for Risk Excellence project.

An important part of risk-related research is how people perceive risks. This work traditionally emphasized aspects of risk such as controllability, man-made or natural, voluntarily or involuntarily assumed, and equitable distribution throughout the population. Because DOE sites are often located in areas in which there are a very broad set of values and views, the risks posed by contamination are often perceived differently by the many stakeholder groups. As a democracy, we cannot lose sight of these views when setting cleanup standards.

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CLEANUP GOALS AND ISSUES

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Quantitative estimates of risk still provide the best information available about the magnitude of the human health risk. We, as a society, can, and should, pursue policies that achieve as much risk reduction as possible within limited budgets. However, we should not lose sight of the broad set of characteristics that govern the perception of risks by those affected. Incorporating these perceptions into risk-centered cleanup goals will not be easy, but it is necessary if we are to uphold the individual rights that form the basis of our system of government.

REFERENCES

Guikema, S.D. and M. Bollinger, 2000. *The Role of Risk in DOE Environmental Cleanup Decision-Making: The Regulatory Requirements*. Presented at Waste Management 2000, February 27 - March 2, 2000, Tucson, AZ.

COMMUNITY VALUES FOR DECOMMISSIONING A RESEARCH REACTOR

By John Carter, U.S. Department of Energy

The Brookhaven Graphite Research Reactor at Brookhaven National Laboratory was the first reactor devoted to exploring peaceful applications of the atom. When the U.S. Department of Energy began planning the decommissioning of this long-closed facility, it first asked the community to describe *its* values toward the remediation project.

The community's response provided the decommissioning team with grass-roots information to enhance its planning for technical evaluation *and* ongoing public participation.

The early participation included three round table discussions to review the decommissioning process and the facility (a Superfund area of concern), and to hear community per-

spectives. Sixty people participated, including local residents and civic association representatives; teachers and students; representatives of special interest groups, businesses and the faith community; local, state and federal elected officials and agency representatives; laboratory employees; and members of the media.

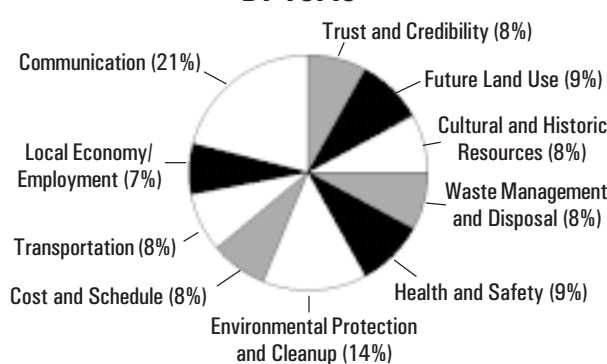
What did participants identify as important (see Figure 1)? At 21 percent, the most stated value was "communication" described as ongoing, timely and well-informed dialogue. Closely related was the community value "trust and credibility" at 8 percent.

Operational considerations (protecting and cleaning up the environment [14%]; ensuring worker and public health and safety [9%]; managing and disposing of waste [8%]; transporting waste [8%]; maintaining cost and schedule [8%]; and, supporting the local economy, including local workers [7%]) accounted for 54 percent of participants' stated values. With this input the Department has:

- Engaged the community in additional discussion to explore remediation and end-state scenarios;
- Formulated a range of end-state alternatives; and
- Formed a community working group to participate in the decommissioning project during the several years it will take to complete.

For more information, contact John Carter (631/344-5195; email jcarter@bnl.gov).

Figure 1: COMMUNITY VALUES RECORDED, BY TOPIC



WORKSHOP BRINGS RESEARCHERS AND END-USERS TOGETHER

By Donna Hale, Idaho National Engineering & Environmental Laboratory

Over 500 people attended the Environmental Management Science Program (EMSP) National Workshop in Atlanta, Georgia held on April 24-28. The program aims to reduce the cost and risk of environmental cleanup through targeted basic science research. At the meeting U.S. Department of Energy (DOE) "end-users" were able to learn about research results from 274 projects. Study areas showcased in the presentations and poster sessions included:

- Deactivation & Decommissioning
- Subsurface Contaminants
- Tanks
- Mixed Waste
- Nuclear Materials
- Spent Nuclear Fuel
- Consortium for Risk Evaluation with Stakeholder Participation
- Long-Term Stewardship and Risk
- Low-Dose Radiation

The workshop was kicked off with a keynote address by Carolyn Huntoon, Assistant Secretary for DOE's Environmental Management (EM). EMSP research projects provide answers to fundamental issues that are critical to the EM cleanup program, enabling solutions that were not possible with yesterday's technology. For example, how recent knowledge about the degradation of dense non-aqueous phase liquids by micro-organisms has altered a regulatory decision was presented.

Other sessions were held on user facilities available to researchers, an American Society for Testing and Materials guideline being developed to define a process for research transfer, and a training course, Natural Monitored Attenuation, sponsored by the National Environmental Training Office.

Information on the EMSP can be found at <http://emsp.em.doe.gov>.

SPEAK YOUR MIND

About SPEAK YOUR MIND: *SPEAK YOUR MIND* contains letters about articles published in previous issues of Risk Excellence Notes. The views and opinions expressed by the authors do not necessarily state or reflect those of the United States Government, or any agency thereof, or of the Editorial Board of Risk Excellence Notes.

GENETICALLY MODIFIED ORGANISMS: NATURAL VS. UNNATURAL

The April/May 2000 issue of *Risk Excellence Notes* included two thoughtful responses to the Genetically Modified Organisms (GMOs) articles in the previous edition. Shaw expressed the concern that GMOs have been extensively released into the environment without an adequate process to evaluate their long-term impacts. He recommended a rigorous challenge-review system to provide safeguards against unanticipated effects. Coalgate suggested that "instinctive wisdom" is the most reliable guide to whether or not our actions in developing GMOs are really in the long-term interests of our planet.

By its very nature, agriculture disrupts natural ecosystems. Monoculture, irrigation, erosion, and pesticides are some of the major contributors to this disruption; GMOs must be added to the list of changes that should be evaluated.

"Single gene" modified crops are evaluated in the same manner as any new variety, namely after an exhaustive 14 –16 years of field evaluation by Agricultural Ex-

periment Stations and commercial seed companies. The results of these tests ensure that the seeds/plants perform, as they are bred. Safety and efficiency are the "standards" that must be met. The first GMOs moved from the laboratory to the greenhouse and to the field in the early 1980s. They became commercially available in the mid- to late 1990s. They received the approval of the plant breeders, seed companies, and Federal agencies of the United States.

Because of the process involved, i.e., genetic engineering, critics call them "unnatural", and they are. But nature conserves genetic information. As we elucidate the genomes, we are finding commonality of genes between man, animals, microorganism, and plants. Co-evolution occurs, and genes move/modify allowing survival of the species; nature produced pesticide tolerant genes, not man.

An editorial in the May 18, 2000, *London Times*, noted that "science has not be-

come the greatest instrument for discovering the truth about the natural world without making enemies". The editorial notes that many people are happy to benefit from rapid transportation, good health, plentiful food, and the luxury of having time to think, but they are uncomfortable with the process that has been responsible for these improvements. They feel that science is always on the verge of going too far. The *Times* editorial stated, "When people appeal to instincts, and imply they embody a truth to be valued above intellect, this is not only nonsense, but dangerous nonsense".

These differences must be reconciled. The challenge process suggested by Shaw and the comparison of risks of both existing and new agro-technologies recommended by Coalgate should be part of that review.

Al Young, Center for Risk Excellence, Argonne, IL, USA

CLEANUP GOALS

In December 1999 the U.S. Environmental Protection Agency (EPA) – Office of Solid Waste and Emergency Response issued guidance entitled, *Radiation Risk Assessment at CERCLA* (Comprehensive Environmental Response, Compensation, and Liability Act) *Sites: Question & Answer*, (EPA 540/R/99/006). This guidance and the associated transmittal letter contain a rather disconcerting clarification. According to the guidance, the 15 millirem/year rad standard should NOT be viewed as a presumptive cleanup standard. Instead, the preliminary remediation goals (PRGs) should be calculated using the radionuclide-specific cancer slope factors

(e.g., from Health Effects Assessment Summary Tables [HEAST]) and the equations in Risk Assessment Guidance for Superfund (RAGS)-Part B. By my calculations the HEAST/RAGS estimates would result in lower cleanup standards - at least for some radionuclides - than those based on the 15 millirem/year standard. The guidance also appears to imply that PRGs for radionuclides should be based on the CERCLA point of departure value of 10^{-6} rather than the 10^{-4} upper end of the risk range. At numerous radiation cleanup sites around the U.S. this inconsistency will likely cause issues that have to be negotiated by the decision-mak-

ers involved. This has the potential to cause different limits at different sites.

A second issue in the new guidance has to do with aggregation of cancer risk. According to the guidance, cancer risk from radionuclide and nonradionuclide carcinogens should be summed to provide an estimate of the combined risk presented by all carcinogenic contaminants. In the past this has not been a requirement.

Do you have any advice regarding how we should approach discussion of these issues with the regulatory community?

Steven Clark, Richland, Washington, USA

(SPEAK YOUR MIND Continued on Page 11)

SPEAK YOUR MIND (Continued from Page 10)

I read Bruce Church's article *Unacknowledged Transfer of Risk* (January, 2000 *Risk Excellence Notes*). In it the author cites some startling statistics for two radiation cleanup projects to which he assigns probabilities of worker fatality risk. It is suggested that radiation remedial project fatality risk exceed the annual fatality risk for the U.S. construction industry as a whole. All of this suggests that, all things being equal, radiation remedial projects are far more dangerous for workers than say, building homes. So far, so good.

INVOLUNTARY RISK

Church's point is well taken. Workers are exposed to higher fatality risks than members of the public would tolerate. However, Church's claim that "public policy has given little consideration of..." the effect of ultra-conservative environmental standards on impacts to workers, does not easily flow from the information presented. The implication that worker risks are discounted by those setting public policy is wrong. Public policy must take many factors into account, not the least of which is worker safety and health. Public policy makers know that it is unfair and unproductive to compare volun-

tary risk (e.g., construction work) with involuntary risk (e.g., environmentally induced public health threats). Perhaps inadvertently, Church makes such a comparison by citing what he believes to be unnecessarily protective standards as a cause of higher worker risks (Church's *Table 1. Risk Description In Order of Likelihood of Occurring*). Discounting public health measures in this manner can be misleading, and trivializes real distress people experience when confronted with involuntary risks.

John Bascietto, Washington, DC, USA

RESPONSE TO JOHN BASCIETTO UNACKNOWLEDGED TRANSFER OF RISK

I wish to thank Mr. Bascietto for his comments concerning my statement that policy makers give little consideration of worker risks when requiring compliance to ultra-conservative environmental standards (January 2000 *Risk Excellence Notes*). I must first apologize for the brevity of the article in attempting to comply with the editorial requirement of 300 words. Mr. Bascietto says that, "The implication that worker risks are discounted by those setting public policy is wrong." He further contends that comparing construction work (e.g., voluntary risk) with environmentally induced public health threats (e.g., involuntary risk) is unfair and unproductive. Unfortunately, Mr. Bascietto offers no evidence.

I remain unconvinced that policy makers seriously make any risk cost benefit decisions showing concern for workers. I would like to mention just two points, of many, which support this conclusion. 1) Observation that most remedial action takes place on land historically and currently unoccupied by residents. This is especially true for DOE sites. If land is currently unoccupied then there is a choice in land use, if there is a choice then any future risk as determined by the land use would naturally be one that is volunteered. 2) An ultra conservative environmental standard is illustrated by Hanford's cleanup level for Cesiums-137 of 6.2 picocuries/gram (pCi/g).

This is at such a low concentration that levels in excess of this magnitude can be found naturally in the environment because of worldwide fallout, generally correlated with high rain and snowfall. If policy makers require the extensive excavation and movement of soil with 6.2 pCi/g at up to 15 feet deep then why is it OK at other locations on the surface.

I don't think it passes the "Ho, Ho" test—justifying remedial actions that kill the real people doing the excavating to those concentrations lower than those from fallout, and in places where nobody lives.

Bruce W. Church, Logandale, NV, USA



UPCOMING EVENTS

JULY 16-21, 2000: GORDON RESEARCH CONFERENCE ON NUCLEAR WASTE & ENERGY, New London, NH. Contact the conference (401/783-4011; web site <http://grc.uri.edu>).

AUG. 16-18: FUTURE RESEARCH FOR IMPROVING RISK ASSESSMENT METHODS OF MICE, MEN, AND MODELS, Snowmass Village, CO. For more information contact Estella A. Lazenby (301/588-6000 x239; email elazenby@kevric.com).

NOV. 12-16: SOCIETY FOR ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY (SETAC) ANNUAL MEETING will include a Debate on Sediment Criteria (i.e. Sediment Quality Guidelines), Nashville, TN. For more information on the debate contact Wesley Birge (606/257-5800; email bio110@pop.uky.edu) or SETAC (<http://www.setac.org>).

CALL FOR PAPERS

JULY 31 ABSTRACTS DUE FOR MARCH 4 - 8, 2001: REMOTE DIVISION OF THE AMERICAN NUCLEAR SOCIETY 9TH MEETING, Seattle, WA. For more information contact Neil Norman (509/946-0415; web site <http://www.ans-ews.com/robotics01.html>).

AUG. 4 ABSTRACTS DUE FOR FEB. 25 - MAR. 1, 2001: WASTE MANAGEMENT '01, HIGH LEVEL WASTE, LOW LEVEL WASTE, MIXED WASTES AND ENVIRONMENTAL RESTORATION - WORKING TOWARDS A CLEANER ENVIRONMENT. Proposed Topics:

- 1.0 Cross-Cutting Policies & Programs
- 2.0 High-Level, TRU, Spent-Fuel
- 3.0 Low Level, Intermediate Level, Mixed and Hazardous Waste
- 4.0 Transportation and Packaging



- 5.0 Environmental Remediation
- 6.0 Commercial Waste Management
- 7.0 Public Communication, Participation, Education and Training
- 8.0 D & D
- 9.0 Special Wastes, Migration, TENORM, or other Cross-Cutting or Special Non-Track Issues
- 10.0 General - Abstracts that do not appear to fit into any other category.

For more information contact: WM Symposia, Inc. (520/636-0399; email for abstracts abstracts@wmsym.org; web site <http://www.wmsym.org/wm01>).

FOR MORE EVENTS, SEE "CALENDAR"

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SO, WHAT DO YOU THINK?

Please visit the Center's web site at

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and share your thoughts about the newsletter and our web site.

SUBMITTAL OF ARTICLES, LETTERS, COMMENTS, and QUESTIONS

THE NEXT ISSUE OF *RISK EXCELLENCE NOTES* WILL FOCUS ON DIFFERENCES IN PHILOSOPHICAL APPROACHES TO RISK. Submittal of articles, address changes, and information for *Risk Excellence Notes* is encouraged and should be sent to Mary Jo Acke Ramicone or Nancy Lane at:

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